DOCUMENT RESUME

ED 092 094 IR 000 652

AUTHOR	Hendricks, Donald D.
TITLE	A Report on Library Networks.
INSTITUTION	Illinois Univ., Urbana. Graduate School of Library Science.
PUB DATE	Sep 73
NOTE	24p.; Occasional Papers No. 108
AVAILABLE FROM	Publications Office, 249 Armory Building, Graduate School of Library Science, University of Illinois, Champaign, Illinois 61820 ($5.00 yearly subscription of at least five papers; single papers $1.00 prepaid, $2.00 if billed)
EDRS PRICE	MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS	Evaluation; *Information Networks; Information Services; Information Sources; Information Storage; Interlibrary Loans; *Library Cooperation; *Library Networks; Library Technical Processes; Regional Libraries; Search Strategies; *State of the Art Reviews; Union Catalogs
IDENTIFIERS	*Ohio College Library Center

ABSTRACT

A true library network is the interfacing of more than one kind of system (i.e., public and academic) rather than cooperation between libraries of the same type. Networks may take many forms, such as: cooperative development of resources, with assignment of subject areas to separate facilities; a cooperative storage system, with the libraries contributing materials as well as central acquisitions of them; centralized processing, which has had many failures due to inadequate funding and processing delays; cooperative computer uses, for card production from MARC tapes, maintenance of data bases, or creation of union lists of serials; and regional sharing of resources for access to little-used materials. (One of the more successful networks now operating is the Ohio College Library Center.) Communication between network units may be by facsimile (which is most expensive), telephone, TWX, microwave network, or satellite. Access may be by interlibrary loan or copy. Some problems have been: patrons want material immediately, without delay; and questions of copyright have not been resolved. Bibliographic access, whether by cards, computer, or printed lists, is the key to network operation. (LS)

ED 092094

DATE Sept. 1973 NO. 108

University of Illinois Graduate School of Library Science

US ISSN 0073-5310

OCCASIONAL PAPERS

A REPORT ON LIBRARY NETWORKS

by
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INTRODUCTION

This report is the production of a Council on Library Resources mid-career development grant which enabled the author to visit various library networks and study those cooperative efforts which, on a cost/benefit ratio, were succeeding to some degree, and those similar endeavors which appeared not to provide useful cooperative solutions to current library problems. Most of the major library cooperatives were investigated; but some were unavoidably missed, so this account is not comprehensive.

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LIBRARY NETWORKS

The start of any report is the definition of terms, and "library network" is an elusive a term as one might find. Parallels and analogies are illuminating, and since this reporter has been reading in the field, he has kept a log of these. Library networks have been described as fish-nets, cobwebs, fences, pebbles in pools, blind men with an elephant, the Emperor's new clothes, and, Dr. Johnson's definition, "Anything reticulated or decussated at equal distances, with interstices between the intersections." Telephone systems and public utility networks have also been used as parallels. The human body analogy is probably the best--there are nodes, an extremely effective communication system, both internal and external, a highly developed computer center at the top with both storage and action programs, and the ability to interface with other such units.

Library cooperatives, consortia, or systems are not networks, but they may very well contain network elements. A group of individual libraries of the same type working together is a library system: a public library system, an academic library system, etc. When two library systems start interacting, then a true network activity develops. The interface of systems is the distinguishing feature that separates a system from a network. A library user in a remote Texas City, seeking an item, can follow the natural sequence of the state public library system and proceed through hierarchical lines to the state library in Austin. If the state library does not have the item, the patron has exhausted that system. When the state library switches the request to the university for filling, then networking has come into full meaning. Some of the activities described below will not be network activities; they have the potential characteristics to evolve into network functions, but thus far few of them have done so.

In traveling and studying the library network arena, eight categories or programs devised by library networks were identified. This outline, given in Chart 1, would serve almost equally well to describe the scope of interlibrary cooperation in general, i.e., it is not limited to relations among libraries of different types. It is correct to state, however, that every type of cooperation enumerated is practiced somewhere by two or more libraries of more than one traditional category. The eight headings used are neither discrete nor consistent in their classification. An attempt was made to evolve a pyramid or hierarchical pattern to these topics, but they do not fit into convenient layers--they overlap and intertwine. The lines forming the pyramid, constraining the shape and holding the entire form together, have been designated as the communication activity.

PLANNING

As indicated in Chart 1, the initial undertaking must be a survey of resources and needs. One must know what is needed, know one's goals, and have a plan of attack. An integral part of this stage of the planning effort is the development of funding proposals to support the activities identified as common objectives.

NETWORK ACTIVITIES

The lines represent COMMUNICATION which ties all the possible activities together.

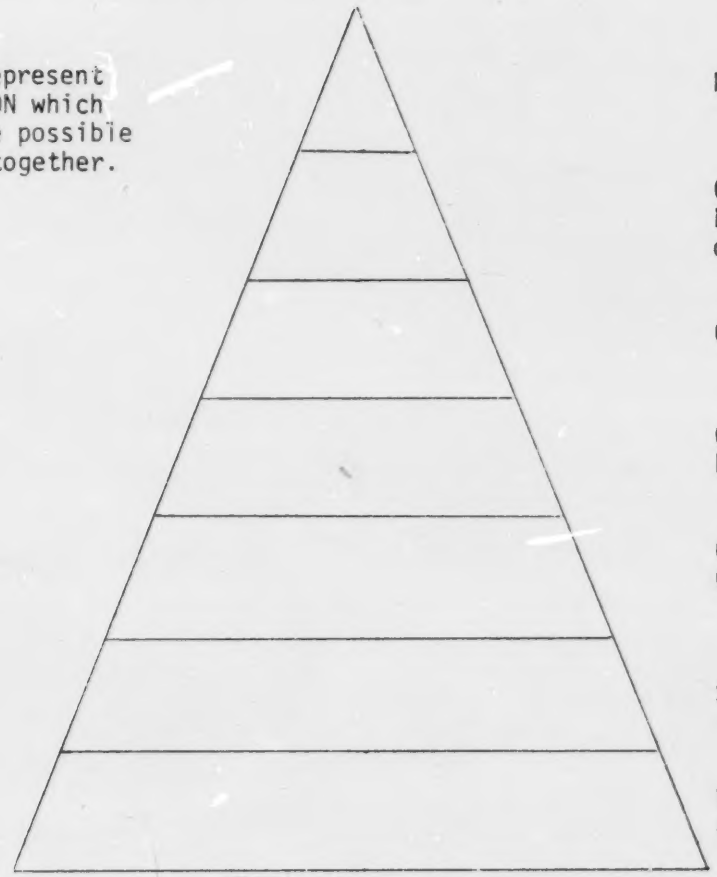

Chart 1

Surveys and plans abound in the literature--the New York surveys, beginning in 1961;[1] the several Nelson Associates studies, such as those for New York; Lowell Martin's surveys, as in Pennsylvania,[2] and others; the Becker and Hayes Wisconsin study;[3] Resources of Texas Libraries;[4] the Humphry brothers' Louisiana survey;[5] the work done by Robert B. Downs,[6] etc. These are broad studies doing exactly what their names imply--surveying the library resources and needs of an area, usually a state but often a smaller area. The handmaiden of the survey is cooperative planning, and examples are legion--the pervasive example would be the advisory committees required by Title III under the Library Services and Construction Act.

Have these plans and surveys provided what they promised? It is a mixed bag, and throughout this report planning successes and failures will be pointed out. Some impressive demonstrations of plan implementation were noted--the systems in Illinois rate at the top. There is a network of systems so sophisticated that even separate buildings have been built for systems headquarters. Many special services are provided which, separately, the libraries could not enjoy--an excellent example of what planning and a concomitant legislative drive for funding can produce. Other states are involved in good projects, but some operations are fairly dismal. New York plans are good, but funding levels have peaked out.

Now everyone has a plan--state plans are required under LSCA, and the regional medical libraries are required to set forth plans based on objectives. By these requirements, it is hoped those involved in planning will be more amenable to participation in the projected changes. Broadbased decisions can be made by those in authority, and those are the people usually engaged in the planning effort. The performance here is generally good and outstanding in the places mentioned. Implementation depends on funding levels, and the transfer from federal stimulation grants to local support, as in Texas, has not been uniformly successful.

The weakest part of this whole process is evaluation. Evaluation is important; built-in tests and measurements of how well activities are going are needed, but this stage has been neglected in most planning efforts. Evaluation is difficult when "in-house" library operations are involved; it is hard to define and measure library tactics. However, the entire process, from identifying the needs of the user to judging the quality of service he finally received, is extremely complex in regional services. A good illustration is the Regional Medical Library Program (RMLP). In 1970, new management was introduced at the National Library of Medicine to coordinate the RMLP. The RMLP was started in 1965 with the passage of the Medical Library Assistance Act. Services had loosely developed along the lines that librarians thought they should--equal access.

One of the first heretical thoughts introduced by the new program manager was that doctors in the field did not keep up with, did not read, current literature when available. Doctors get their new concepts from drug salesmen and attendance at professional meetings. When they have a difficult case, they telephone and ask the specialist at the research center what to do, or they refer the patient to the medical center. Thus, it was felt that resources could best be utilized in developing a number of highly

centralized and concentrated information centers around the nation. There is a parallel in librarianship; librarians who keep up in their fields are rare. At the graduate centers, of course, there is a great deal of research work--study and keeping abreast of developments, but the average public, college, or school librarian in the working situation does not read much professional literature. (This observation is strictly an empirical one.)

Another factor in the field of medicine is the claim that doctors whose education is more than five years old cannot understand what they read in a clinical journal. The techniques, the methods, the research reported would be so different from anything they were trained in or had dealt with in their practice that their formal education would be obsolete in preparing them to read reported research.

The RMLP has not changed this-- people in the field are still wrestling with the dichotomy of providing equal access to information for practitioners located far from a graduate center vs. emphasis on concentration of library resources in these centers. The former approach was the initial plan; now one authority feels that perhaps the theory of equal access is faulty. The experience in the South Central Region supports this new management view. Most traffic in information movement is between the research centers. Is this because staff there know of the program and there has been a failure to reach the isolated practitioner? If the isolated doctor knew of the program, would he avail himself of the service? One factor here is the cost. So far it is free, and it is not too hard to sell a free service. But if a doctor were asked to pay $2.50 per article, would he do so? This is another parameter of planning. The problem in evaluating this kind of situation is obvious. It is difficult to measure performance against some criteria when there is uncertainty over the basic aim.

At present, society, as reflected in legislative halls, feels that the delivery of health care and health care information is a priority. When the priorities shift, then the true test of a program occurs. At present, there is a kind of trial or experimental stage with the hierarchical concept of network operation. There are a number of extension librarians assigned to the medical school libraries in the South Central Region, and they are trying to identify and work with small hospital libraries in an attempt to strengthen them--to inform them about the services of the Regional Medical Library so that points of access will be further disseminated. If these small hospital libraries can be brought up to strength so they could fill 60-70 percent of the requests they would normally have to send off for, the quota system imposed on the large libraries would go further toward supplying everyone with the unusual item. The hospital library need only have a small number of journals to reach a 70 percent fill rate--150 titles would cover much of the demand.

This discussion shows why planning and feasibility studies are important stages, and other activities will be cited as evidence of promise and performance in this network element.

COOPERATIVE DEVELOPMENT OF RESOURCES

Shared acquisitions and/or collaborative assignments of subject areas or specific items are probably the most touted but least performed network activities. Other than a few outstanding examples, such as P.L. 480, the Midwest Library Center and the Associated Colleges of the Midwest (the latter two could be categorized as storage activities), it is difficult to identify any solid accomplishments in cooperative resource building. When librarians promote or defend network establishment to their funding agencies, the avoidance of duplication is made very attractive and is a "hard sell" in their presentation. Legislators and businessmen find the idea of reduction in multiple purchase of expensive, esoteric, and seldom-used materials very logical and economical. However, when librarians attempt to implement such policies, the results are often illusory and dismal because librarians are too acquisitive and the faculty too demanding of immediate access--factors precluding little more than lip service to this concept. Several networks visited had provided this objective in their establishing document, but the implementation of the plan had not been successful.

Use studies of periodicals in a special library disclosed that from a file of 2,500 journals, 250 titles accounted for 85.6 percent of the circulation. The study was projected to include an additional 200 journals with a prediction that these 450 titles would account for 95 percent of the circulation. This, however, proved not to be the case. The addition of these journals accounted for less than a 2 percent increase in the circulation base, so that 87.3 percent of the total journal circulation was recorded. This means that most of the journals are used infrequently, and many are never used outside the building. When recommendations were made to reduce the number of journal subscriptions, resistance was encountered. This reluctance took several forms.

1. A solid run of this journal is already owned; it should be continued.
2. The journal is used within the library.
3. Patrons will not wait to get photocopies from other libraries.
4. Members of the management staff are on the editorial board.
5. No library in the immediate area takes the journal.
6. The journal is relatively inexpensive.
7. The institution may not presently have a strong program in this specialty but should maintain or build the collection for future use.

The libraries of the interuniversity Council in the North Texas area have been successful in periodical sharing and rationalization. The libraries form a true network as they represent several different types of institutions. A communication network (closed teletypewriter) and a delivery system were in effect at inception of the cooperation. Working from a list of scientific periodicals that cost $90 or more per year, the librarians agreed to drop a composite total of $75,000 worth of journal subscriptions. Eight libraries were directly involved, so this represented substantial savings for each. As the titles were discussed, at least one library would agree to maintain the title for the benefit of all. Some exchanging of back runs between libraries did occur.

Other lists of expensive serials in the social sciences and humanities are being developed. The process is slow since there is no union list of

these available, and it is a laborious task to compile such a list from the records of eight different institutions. The difficulties faced in this project reinforce a point made later in this paper: bibliographic control undergirds any kind of cooperative project.

The South Central Regional Medical Library Program has a union list on which to base serial rationalization, and a number of activities have resulted from the availability of this list. Several meetings of the resource libraries were held at which a number of periodical subscriptions were deleted from the lists provided via centralized computer record. It was agreed that one or more libraries would drop a lesser-used, expensive, or out-of-scope journal; another library would agree to retain that subscription. No record of financial savings was kept, but a significant number of journals went through this rationization process. Some back issues were transferred to insure full runs at a given library. Under the present procedure, each resource library is supposed to submit a list of their newly entered subscriptions to the regional library where the lists are compiled and distributed to the other resource libraries. This procedure has not worked as well as it should because the regional library is too often not notified of new journal subscriptions. As price increases and inflation take their toll in budgets, more cooperative acquisitions projects will be developed.

STORAGE

Cooperative storage is a promising phenomena. Libraries do not need ready access to seldom-used materials; by sharing storage facilities, they enjoy the common benefits. The Center for Research Libraries (CRL) in Chicago began with a storage concept, but it is evolving more and more into cooperative development of resources. The CRL is not only accepting certain classes of material from its participants, but is actually purchasing expensive and projected little-used materials to fill in gaps in the collection. This is a very expensive operation. Some users have estimated costs as high as $100 per use of an item from this collection. Of course, if a library had to buy, prepare, circulate, and retain that item for posterity, it would probably cost that and more in the long run.

The Associated Colleges of the Midwest (ACM) are an interesting case in separation of theory and practice. This group of smaller colleges in the Midwest, church-related as well as private schools, joined a consortium to house little-used periodicals to form an active bank on which they could draw. They identified about 1,500 periodicals they thought everyone should and would have, then proceeded to collect lesser-used files. They accepted gifts from the participants and purchased many items on microfilm. As they built this collection, the ACM received many of the items previously identified as being commonly held. Currently the traffic from this bank is largely based on the 1,500 journals the planners thought would be available on the local level. Users at this level do not require the scholarly back files to the same degree of intensity that they desire the general periodicals. The local issues are lost, mutilated, stolen, at the bindery, or misplaced, and the large majority of requests are aimed at the very items thought to be available at the local level.

The hierarchical pattern of system and network organization leads automatically to a storage concept. A back-up resource or regional library may, because of its designation, decide not to discard or weed out materials so it can fulfill its supporting role. As participating libraries down the line do become crowded, the regional library may find itself the recipient of other libraries' discards or "last copies" within the region. This may or may not be a welcome or convenient role, but if networks are to operate according to design, some one place should be identified as the retention point for lesser-used or out-dated materials in scope.

Microforms should begin to play a larger role in the storage function. As patrons become educated in the use of this technology and as the technology itself improves, market resistance to use of these forms should diminish. Massive replacement of hard copy for dated or lesser-used materials with microprint will have a significant impact on space requirements. Copies from microforms can be made readily, and microprint itself can be mailed easily for use in other libraries. It is essential that supporting hardware be adequate in number and in good working order. There is a built-in resistance to these devices; if nonfunctional at times, user frustration will lead to poor public relations.

With selective retention, compact storage, and microform programs, the storage function should not become a large burden causing the continual need for expansion of present buildings or construction of new facilities.

COMMUNICATION

In chart 1, network activities are arranged in a pyramid, and the lines forming the three sides of the pyramid which hold this amorphous mass together are designated as communication. There are several aspects within this topic that relate to library networks. The management role that successful communication plays in library cooperation is obvious. Technology in facilitating information transfer is another segment of this topic. Communication is one of the very basic problems of cooperation and network operation. Each participant must be kept informed in order to feel a sense of partnership in the endeavor. This is management strategy today--everyone participates. Several network administrators mentioned the issues that arise when library directors (party to decisions in a network advisory council) fail to relay policy or procedural decisions reached at that level to their respective staffs who are responsible for effectively implementing such policy.

In terms of new communications technology, facsimile transmission presents appealing possibilities, but the cost is appalling. The California State Public Library System had plans to try facsimile transmission, but they have just appointed a new state librarian, so perhaps that plan will be revised. New York State reported a cost of $62.10 per request filled during a ten-month period.[7] The University of Pennsylvania experienced an average cost of $12.28 per page over a six-month trial period.[8] Transmission time was six minutes per page, although this time has since been reduced to four minutes.[9] Most librarians are willing to try new things; but there is not

much library information that cannot be provided in a longer turnaround time and still satisfy the user, even in the medical field, at least until these costs are reduced significantly.

Leased telephone lines permitting small, remote libraries to enter the network chain can provide common benefits. The TWX network is spread across the nation and is well established as the main method of network interface. The TWX has the benefit of high-speed transmission at a reasonable cost with hard copy in multiple units at the receiving or sending stations.

The use of microwave networks was not observed for direct library operations, although some network activities could be managed on microwave bands. Continuing education classes are an area in which microwave transmissions are used, and some of these are supported by ancillary library efforts.

Satellite transmission of library information is a new application of technology, and such a unit is planned to connect the medical libraries of Alaska with the University of Washington Medical School Library in Seattle. The Lister Hill National Center for Biomedical Communications recently awarded a contract[10] to the University of Alaska for an experiment in satellite voice communications to support health care delivery in remote areas of that state where reliable telecommunications facilities do not exist. A Public Health Service medical officer, Barry Beattie, has been assigned to Alaska to provide liaison and evaluation of the project during the next two years.

Twenty-six supporting sites throughout the state of Alaska will be strategically located in order to evaluate potential major improvements in health communications. The National Aeronautics and Space Administration's Applications Technology Satellite (ATS-1), in synchronous orbit over the Pacific Ocean, will provide the voice communication channels for medical consultation between remote villages and service unit hospitals, and between those hospitals and the Alaskan Native Medical Centers. Several other hospitals are also included in the network. This experiment will test the usefulness of satellite communications in providing remote support and in developing a corps of medical personnel experienced in operational procedures for satellite communications. It is anticipated that equipment will be installed in 1974. Planning is underway to use some of the system, in cooperation with the U.S. Office of Education, for education of native children.

In connection with the Alaska experiment, contracts have also been awarded to the Universities of Wisconsin and Washington and to Stanford University. Staffs of the medical centers at these institutions will cooperate in identifying appropriate medical information for transmission via the ATS-1 and evaluate the quality of the information and its usability for diagnostic purposes after transmission. Designated information will then be considered for inclusion in the University of Alaska's health care delivery experiment.

CENTRALIZED PROCESSING

Three years ago this reporter felt that centralized processing was the answer to high costs in library services. Recent experience has tempered this view, and observations in recent travels raised further doubts. It was not that bad examples of centralized processing were observed, but rather some good ones were seen with the realization of how fortuitous were the circumstances that favored the creation of a successful processing center. The happy marriage of all the elements is extremely rare. It takes a good administrator--one who can make the technicalities work while doing the public relations job of keeping the participating libraries happy. It takes money--no processing center was found which was not subsidized from other sources or somehow supported by space allocation, indirect costs, or overhead allowances. Operating a good processing center is a chancy thing at best, but good examples were seen in Louisiana, California, Canada, New York, and Washington.

The theory of centralized processing is easily stated; a book is written once, published once, but cataloged thousands of times. Why not catalog it once? We had a national scheme that started to do that in 1901, but somehow it never seemed to do the job.

The processing center operated by the Louisiana State Library is an excellent example of planning strategy. This state library planning group looked at the network potentials, the activities outlined overall, and deliberately chose centralized processing as the one best service the group felt it could offer. From this concentration of effort, it got back a well-run processing center. Now, on this service and the union catalog, which is a by-product, the group has captured the interest and enthusiasm of local librarians in other activities. It has started a regional library system in the corner of the state. There are six parishes in this region; the group has established a reference center, reciprocal borrowing privileges, and a courier service. By selecting one activity and performing it well, the state library has systematically begun a program which will, in time, provide all kinds of network activities for the state. There are problems; operating the processing center as a branch of a larger institution leads to conflicts in goals, but that is another story on network administration.[11]

This report will not dwell on the successes; the failures are more significant and interesting. Reference should be made to two negative situations: the first actually implimented and another plan which was aborted after a feasibility study. The Colorado Book Processing Center (COLBPC) trial has a lesson for the profession. There were several publications about the establishment of this center, including periodical articles and two monographs. The first book dealt with the planning stage[12] while the second monograph reported the final results.[13] This reporter reviewed the first book and gave the study a favorable review.[14] It looked good in terms of the cost and other study parameters that went into the planning.

In July 1972, there was an opportunity to visit this center, and it was a sad occasion to see it in its death throes. An outside consultant had just recommended that it not take in any more books. The board is seeking ways to become another OCLC-type operation, and perhaps assist member

libraries in original cataloging. Also visited was the Rocky Mountain Bibliographic Center, and it seems that the two operations should somehow merge. No evidence of any plan in that direction was noted nor was there time to study the situation long enough to see exactly how they might mutually benefit.

Why did COLBPC fail? A number of factors led to its demise. First, the cost estimate of $2.60 per volume was too low. If a processing center is doing a large number of multiple copies of current, common materials for a library system, that price might be justified, but not for a group of academic libraries, even if some of them are quite small. The second factor was the delay in processing that occurs--and this is the largest public relations problem that a center administrator faces. Books cannot be shipped to a fourth location and be received as fast as an individual library can obtain them. The usual route is order to jobber to publisher, and book to jobber to library. If another stop with two additional transshipments is added, a great deal of time is consumed, not to mention all the other things that can go wrong. This is not to say that the individual library gets the books out any faster; they may set on the backlog shelf just as long. However, the order department can point to it as being there, and it can be made available "rush" to a demanding faculty member.

The third large problem was that of location of the center in an existing library setting. Problems were created when the largest academic library in the state, then adding 100,000 volumes per year in an already crowded building, was required to absorb another discrete function which, allegedly, would help them with their cataloging.

Finally, and most importantly, was the lack of real commitment on the part of the participating librarians and their staffs. They were not really committed nor cooperative from the beginning. When told it was cheaper and faster, they maintained a "show me" attitude, and they were never shown. It is not possible now to reconstruct why they were reluctant to participate--the feeling ranged from passive acceptance to articulate and combative resistance. Perhaps they felt the project had been forced upon them. But any such speculation is merely conjecture at this point, although it would make an excellent case study in what went wrong. Something did go wrong, and the lesson should be heeded in the future.

In the RMLP, there has been increasing concern about the costs in duplication of cataloging. This concern led to the formulation of a research proposal to study the feasibility of centralized processing for medical libraries in the South Central Regional Program. According to Bowker, there are only about 1,500 titles published in medicine each year. Logically, why should each library catalog these books? The proposed grant was limited to the study of five of the medical school component libraries of the University of Texas system since, in theory, these libraries would all be under the umbrella of the same business and accounting procedures of one university system. Any projections could then be extended to the other major medical libraries in the region.

This study was promptly funded by the Research Division of the National Library of Medicine, was completed in July 1972, and is presently undergoing

final preparation. But the results are in, and the picture is not optimistic. First, the assumption of common business and accounting procedures among the five libraries was completely erroneous--there would probably be greater agreement between the medical school libraries of Arkansas, New Mexico, and Oklahoma on that score. Secondly, the rate of duplication was very low, especially in the past five years. This is revealing since the availability of current materials is such a critical matter in the medical field. Of course, it was not a typical period. One library is quite new and is adding basic materials to its core collection. Another library is older and has extremely good fortune in obtaining funds to purchase rare books (much of its cataloging during the study period represented those acquisitions.) Another library is developing a strong allied health program, and the materials to support that program were purchased during the study period. In looking at the past and present dynamics of these schools, one wonders if any period would be stable or typical. These existing factors seem to negate the value of centralized processing, but even more important are potential future developments. National Library of Medicine (NLM) cataloging is widely available; cataloging-in-publication will be a factor in the very near future. If NLM can get CATLINE in operation before the end of the year, then those with MEDLINE terminals will have immediate access to all present and future cataloging records. Furthermore, the success of the OCLC in their use of MARC tapes would suggest that all libraries will soon have easy access to cataloging data.

This writer would be very reluctant to recommend the establishment of any processing center today. The factors mentioned above are negative elements for a medical school or any type of library. Centralized card production on a regional, statewide, or area basis has merit. There is no advantage in handling the books. The problems of receiving, processing, and shipping are too great to be overcome by the rather minor benefits of an assembly line for the physical processing of the book. It would be better to get a kit produced by a computer and have students or volunteers do the processing. There are large-volume public libraries and systems that do a good job, but future developments will tend to diminish their value, at least when balanced with the complexities of starting a new center.

COOPERATIVE COMPUTER USE

Cooperative computer centers are a new phenomena in library systems, and only a few were observed. The OCLC, discussed below, is the most outstanding example. The Oklahoma State Library is currently spinning the MARC tapes as a statewide service and providing LC card copy on demand as well as providing SDI services on a number of topics.

Several of the libraries in Texas are involved in cooperative computer use. San Antonio Medical School Library is building a combined data base with a consortium of academic libraries operating out of Trinity University. This data base is built on the MARC format and lists of various types can be printed. The University of Texas Health Science Center Library at Dallas is presently using the MCST (Magnetic Card Selectric Typewriter) to prepare card copy for transmission to the computer at the University of Texas at Dallas for card production and data base building. This whole area is one

of interest since the University of Texas system has just installed a regional computer to serve the University of Texas at Dallas, the University of Texas at Arlington, and the University of Texas Health Science Center. The computer will be located on the Health Science Center campus. How this will affect each library's use of the computer remains to be seen.

The University of Texas Medical Branch at Galveston was funded to create and maintain the union list of medical journals for Region IX of the Regional Medical Library Program. This project certainly would come under the heading of cooperative computer use because 34 libraries have submitted information on 11,400 titles with 60,000 holdings records. This union list program, on a regional basis, follows a similar pattern for the nation. Generally, shared computer use by libraries has been for bibliographic control. Stanford University has recently (September 1972) been granted $650,000 by the National Humanities Foundation to form a regional bibliographic center.

SHARING RESOURCES

The most popular network activity is the sharing of resources in terms of use. The theory here is obvious; all libraries can stay more "in scope" with their collections if they can satisfy the peripheral needs by using other local collections. Statewide access is common, with state aid to strengthen local libraries and resource centers. There are also access agreements--consortia of academic libraries agree to extend reciprocal borrowing privileges to each other's graduate students. The liberalized interlibrary loan and copying procedure now so common is manifest across the nation.

The copyright suit brought by Williams and Wilkins against the National Library of Medicine may have a resounding impact on the present national pattern of interlibrary loans or document delivery by photocopy. The publishers do have a point; in theory, subscriptions to a seldom-used journal could be reduced to those placed by the regional libraries (ten across the nation), to be shared by photocopy or facsimile transmission. Obviously, no journal publication could exist on such meager subscriptions, and the cause of scholarship would not be served. Some fair and equitable solution must be found to insure the publisher a fair return yet not impede the dissemination of scientific knowledge within the research community.

There are many examples of resource sharing, and the New York METRO System is a prime example. A 1968 study led to the launching of a Shared Acquisitions and Retention System (SHARES) project, to improve access to little-used or difficult-to-handle materials and to free space on the shelves of member libraries. The first accomplishment was the establishment of a regional depository for U.S. government documents. METRO will serve as a clearinghouse for the New York State Library and make it possible for depository libraries in the area to discard items which they no longer need.

As the next step, METRO is assembling a collection of current catalogs of all the schools given on lists of "American Universities and Colleges" and "American Junior Colleges." These will be available through the Mid-Manhattan Branch of The New York Public Library. A comprehensive archival

collection in the Annex of The New York Public Library Research Libraries will allow member libraries to discard all but the most heavily used back files of catalogs. A pilot project to test the usefulness of a local bank of doctoral dissertations in a narrow subject field is in the planning stage. However, it is still true that in all kinds of cooperation of this type, the large library gives and the small library benefits.

ACCESS

The main thrust of legislative drives for library support and concommitant professional concern has focused, both state and nationally, on equal access to library materials for each individual. Since it is not realistic to expect any specific library to be able to supply the materials to satisfy every request, interlibrary cooperation in loaning materials seemed to be the answer. This has now evolved, in the network concept, to levels of services. The local unit can supply the bulk of the requested material, the most-used items. Local service is then supported by dependence on a larger unit which is given various designations in library parlance, such as "regional" or "resource" center. This level of resource strength is usually supported by a large research library or a national library as the last resort for obtaining the requested items.

This network organization has given rise to all the problems inherent in any kind of system or network whether it be a computer network, an auto or appliance part supply network, etc. Some of these problems are:

1. What should the local unit be expected to provide; i.e., what percent of requests received should be filled at that level?
2. For the requests not supplied, what kind of routing system should be used?
3. Should there be a switching center, or are network users free to explore communication lines and attempt to identify locations?
4. What are acceptable time frames for the location and receipt of materials?
5. The patron can expect a certain level of service at the local unit. But who should pay (and how much), for additional services?
6. What types of information resources other than printed material can networks be expected to locate and provide?
7. Libraries are characterized by type, geared to their user population. What is the deposition of materials "out of scope"?
8. How do we evaluate network services at each of these levels?
9. The profession has adopted an interlibrary loan code. What is the relation of this code to network performance?
10. Who are qualified users of the mechanism? The need of an elementary school student for information may be just as real to him as the need of of a graduate student.

There are two aspects to these questions--locating the source of the information and obtaining the material. Although not mutually exclusive, the two phases, physical and bibliographic, have been separated for treatment.

BIBLIOGRAPHIC ACCESS

Printed indexes of library collections in a variety of forms have increased greatly in recent years. The local library, lacking an item, has the option of using a number of tools to locate its existence. The cost of locator devices is an inhibiting factor: could a small library afford the multitude of catalogs and union lists available, the patron would have access to the wealth of the nations libraries, although not immediately. One solution to the problem of high cost of locator tools is to provide a central location where specialized staff and speedy communication can locate the materials and relay the request. Often the local library must assume that its particular back-up library has the material, but the need for unverified location requests is rapidly diminishing with the abundance of printed catalogs, computer-produced book catalogs, and union lists.

The operation of regional bibliographic centers seems to hold the most promising solution to the location of needed items. Provision of a central place for bibliographic information could parallel the "levels of service" in a network scheme. With inexpensive and rapid communication, such centers can logically serve several states. A multiplicity of such centers would be redundant in cost, and the only advantage would be to shorten the distance an inquiry must travel. If the center not only locates the item, but forwards the request, it provides an additional valuable service to the local unit.

Two of the outstanding bibliographic centers of this type are the Pacific Northwest Bibliographic Center and the Rocky Mountain Bibliographic Center, providing regional services to areas with few large population centers and a scattered rural population. These centers gather records, now in the form of catalog cards, for new items added to libraries within their respective regions. They both include records for public and academic libraries. These records are then assembled in one file which forms a union catalog of regional holdings. This catalog is supplemented by a variety of printed library guides, catalogs, and other printed union lists, so that a comprehensive bibliographic collection is available. In addition, both of these centers are headquartered in large libraries and have access to the resources of the host institution.

SPECIFIC NETWORKS

PACIFIC NORTHWEST BIBLIOGRAPHIC CENTER

A visit to this operation was very instructive. Besides the usual tips in operational and procedural matters one derives from visiting other operations similar to one's own, this particular situation reflected several of the network operational problems set forth earlier.

Inequities in funding the operation of the center was one of the larger problems at this point. The needs of the states within the Pacific Northwest Bibliographic Center (PNBC) region with smaller populations and resources are great, but obviously their support levels are low. Alaska is an extreme example, while Montana is perhaps more typical of a state which has been on the receiving end of service yet contributes least. Table 1 shows the

dispersion of requests received in this region. Present funding is derived from the various state agencies under Title III of the Library Services and Construction Act; the assessments are based on a formula of population percentage in each state. Grant funds from the Washington and Montana state libraries and the U.S. Office of Education are providing an additional $42,000 for the current year. These funds are designated for nonrecurring projects and research. The PNBC has recently (April 1972) completed an operations research study which was geared toward a solution of the funding problems. In addition to the funding situation, several policies in operation were illustrative of the types of network problems encountered.

Table 1

Interlibrary Loan Requests Received
By Geographic Area
July 1971 - April 1972

Area	Requests Received by PNBC	
	Number	Percent
Alaska	2,569	10.18
Idaho	2,074	8.22
Montana	2,738	10.85
Oregon	3,833	15.19
Washington	13,078	51.81
British Columbia	800	3.16
Subtotal for Region	25,092	99.41
(Outside Region)	148	.59
Grand Total	25,240	100.00

The PNBC is a switching center. To avoid being inundated by requests from small libraries which have not exhausted possible local resources for material that is widely held, it will accept only requests originating from state library agencies. Table 2 shows the growth of service in the last few years.

Even when a badly formulated request is transmitted by a state library, it is deemed best to make every effort to fill it rather than return it for precise bibliographic data; a practice which differs from that of many bibliographic centers. The loss of time entailed in returning a faulty request (with the likelihood of its being referred back to the staff member who filed it), may result in the patron who asked for the information receiving it too late for his use. Experience has shown that this is too often the case, due mainly to staff shortcomings. When faulty requests from the same institution keep recurring, it is called to the attention of the library administrator

who can then institute training sessions to correct his request procedures. The PNBC feels it is an extension of the staff in every library, and takes pride in serving as an adjunct in this respect. The PNBC tries not to burden the usual large libraries with the bulk of the requests. It avoids this by diligently checking every request against its Union Catalog, with the result that not infrequently a smaller library will be found to have the desired item. Some success in equalizing the load is thus achieved.

Table 2

Interlibrary Loan Requests Received at PNBC
1962 - 1972

Fiscal Year	Number of Requests
1962	14,092
1963	14,465
1964	15,348
1965	16,223
1966	16,077
1967	18,122
1968	19,368
1969	17,511
1970	17,766
1971	21,213
1972	31,502*

* Estimate. 28,378 through May, 1972

The degree of duplication at the PNBC is very small, as shown by Table 3.

Table 3

PNBC's Union Catalog Number of Locations Per Title April 14, 1972 (Sample of 592)

Number of Locations Per Title	Percentage of all Titles	Cumulative Percentage
1	48.31	48.31
2	17.57	65.88
3	7.77	73.65
4	4.73	78.38
5	5.07	83.45
6	4.73	88.18
7	2.03	90.21
8	3.04	93.25
9	1.69	94.94
10	1.35	96.29
More than 10	3.71	100.00

The decision concerning cooperative resource building is another related benefit. If the center staff cannot find an item in the region--an item that one could reasonably expect to find--it suggests to the state agency that the item be purchased and made available to the requesting library. This may take longer than searching the item outside the region, although sometimes both avenues are explored, but suggesting purchase does have the effect of closing gaps on the regional basis.

The staff hopes to microfilm a large portion of the union catalog, especially the older, more stable, section. This will enable libraries in remote locations to locate a number of items for themselves.

Serials information, a planned inclusion in the PNBC, will greatly assist resource building. The PNBC has a unique service in that it actually fills requests for articles which can be obtained from journals held in their host library, the University of Washington. Because of their own location, versus the remote location of the University Library's photocopying service and complications in billing procedures, the PNBC has obtained its own photocopier and provides, without cost, copies of articles from journals which are housed on two floors just adjacent to the office. This service is provided on a daily basis, and the center administration is strongly opposed to the delay and inconvenience that libraries have placed in the path of patrons' use of the library with all the irritations that go with the use of machines and a fee for photocopying.

ROCKY MOUNTAIN BIBLIOGRAPHIC CENTER

The Rocky Mountain Bibliographic Center (RMBC), located in Denver and hosted by the Denver Public Library, is similar to the operation in the PNBC, and is also funded by support from state agencies. Seventy-five libraries contribute to this catalog, and in 1971 25,000 requests were processed. Some evaluation of collections is an outgrowth of the assembled data base; a recent example was the study of the strength of environmental materials among the reporting libraries. Collection management activities take place in that subscribers are asked to sign a document of commitment which requires them to report acquisitions of expensive material. This information is then made available to other libraries to assist them in their purchasing decisions.

This center experiences the same concern with funding inequities, but since the states involved are perhaps more homogeneous, it is not such a problem. The RMBC is also considering microfilming the retrospective catalog.

OHIO COLLEGE LIBRARY CENTER

The most dramatic and portentous effort in library networks seen by this observer during his travels was that at the Ohio College Library Center (OCLC). This effort to create a computerized location device for bibliographic access and a cataloging tool is remarkable for several reasons. Much has been written about the center and its technical operation; there is little value in including that kind of information in this paper. The intangibles of this development are the significant results. This project parallels and is as important to librarianship as the space program is to science; a great deal of money was involved, but the advances made and the side benefits are invaluable.

In the first place, the OCLC is an operational unit--it works. Anyone who can hunt and peck on a typewriter can interrogate the data base. The Library of Congress staff has had a series of MARC users meetings around the nation describing the potential uses of the MARC record, itself an expensive development. OCLC, however, is the first effort wherein these tapes were utilized in a depth approaching their full potential. The analogy with the space program is not farfetched because the OCLC represents, for many librarians trained in a former period, the first meaningful demonstration of the power of a bibliographic machine. The librarian can operate the device and see for himself the present and potential uses it possesses.

The value of this installation as a prototype has been demonstrated by the number of visitors who have traveled to Columbus, Ohio during the past two years. Another testament to OCLC impact is the number of other networks which have contracted with OCLC for service or are replicating the project in other regions. It is predictable that within the near future there will be a series of regional OCLC-type systems interconnected and forming a true library network for the entire nation.

A number of other network visits, especially in the eastern part of the nation, focused on their interest in, or attempts to contract with the OCLC. NELINET, FAUL, and the consortia of Negro colleges in Atlanta, Georgia, are the other networks which have actually engaged in OCLC participation by contract or replication. Other library consortia, including the Washington State Library, have been negotiating with OCLC.

This reporter is firmly convinced that installation of an OCLC-type, machine-readable bibliographic data base is one eventual answer to the mounting costs of technical services in libraries. No immediate reduction in costs could be anticipated, and it will be a long time before the total cost to Ohio libraries is lowered. The concept of shared cataloging has always been touted as a cost saver, and the issuance of MARC records was designed to disseminate Library of Congress cataloging to libraries much more rapidly than could be done with printed cards. With the manipulation of the MARC records now a reality, libraries can have instant access to the entire record. Furthermore, they can modify the record to suit their individual needs (a mixed blessing, perhaps too much tolerance has been permitted); or, lacking a record for the bibliographic unit at hand, the librarian can insert one. The insertions can be used by other librarians. The mechanism is programmed to print catalog cards on demand; when the librarian is satisfied with the image on the CRT, a button is pushed which will activate the print program. A computer-produced set of cards representing exactly the image viewed is received at the library in a week. When accepting or entering bibliographic data, the user also indicates that his library owns the book. Thus, simply appended to the unit record is a record of locations, a computerized union list.

In time, one envisions a library with terminals instead of card catalogs. The library user can call up that portion of the file that relates to his interest. Records of exception can be appended to the file indicating that the book is located in a departmental library, on reserve, at the bindery, in circulation, lost, etc.; any of the events which prevent an item from being in its proper place can be entered on the file. Such computer capacity

can eliminate mindless filing, record keeping and cnanging as well as a whole host of library equipment.

Although this writer was much impressed by OCLC, he recognizes there are things about OCLC that one needs to be careful with. The cost figures are very vague, and anyone contemplating a similar system would be advised to do a cautious study of all the possible ramifications of the economics involved. OCLC now insists that participating libraries may meet their share of the network costs by eventual staff attrition in the technical services and cataloging departments. The center staff feels that, by retirements and reassignments, etc., the work load can be equalized with the simplified procedures made possible by using network services. This method of shifting costs may be viable, but the participating library needs to be fully cognizant of the dual costs involved until such shifts are implemented. Another serious consideration is that of machine utilization. If the programs can be lifted as a package and placed on different hardware, then there is little to worry about. Too often, however, computer equipment salesmen and others, including professional computer people, tend to minimize the problems of program transfer. Simply because a different machine has more power or more storage capacity does not mean it can handle the delicate sorting and organizational problems of library records. These records are among the most difficult to organize, and we can only hope that we do not see some expensive, tragic fiascos occurring from attempts to transfer programs.

The several replication studies[15] underway (some of which are receiving Council on Library Resources support), should best solve these problems for the nation. By careful modeling and simulation, we should get clarification on costs of replication, hardware configuration, and optimum size of the library population that can be accommodated. By including the results of these studies, plus choosing from the best of the experiences of data base construction at OCLC, the profession can agressively propose and pursue the establishment of similar regional centers.

A number of networks could be cited for their efforts toward bibliographic control and access. Most of the Regional Medical Libraries have compiled union lists of serials. In the South Central Region, the list has now appeared in a second edition, accompanied by a supplement. When one considers that this tabulation records over 11,000 serials, with over 60,000 locations within 34 libraries, it is truly a remarkable record. A similar list is maintained and has been published by the Southeastern Region in Atlanta. The South Central Region also has assembled a union catalog of monographs from the participating resource libraries. This catalog is microfilmed each year, distributed to the participants, and sold to other libraries--the present holdings total about 50,000. These are only examples of many such efforts.

SUMMARY

It is interesting to this observer that bibliographic access is the key to network operation. No matter how experimental, innovative, or "blue sky" the basis that a network has for a beginning, it all comes down to one of

the basic jobs in librarianship--proper indexing and location of material. This job can be handled by the flashing lights and push-button world of the computer, or it can be the pure drudgery of assembling catalog cards from different libraries, hand-stamping location codes, and interfiling. Whatever the method, the name of the game is still the provision of material, and, in order to do this we must know where it is. Any other benefit of networks still hinges on this task, and were this reporter to list priorities in starting a network, this basic task would be first. Whether termed collection management, subject specialization, cost-savings through sharing, courier service, communications, or selective retention of materials, the full exploitation of resources depends on knowing what and where they are.

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VITA

Donald D. Hendricks is currently Director of Libraries, the University of Texas Health Science Center, Dallas. He is also Director of the South Central Regional Medical Library Program which serves the states of Arkansas, Louisiana, Oklahoma, New Mexico, and Texas. Prior to this assignment he was Director of Libraries at Sam Houston State University in Huntsville, Texas. He received his A.B. and A.M.L.S. from the University of Michigan in 1955, and his Ph.D. from the University of Illinois in 1966. He has been director of a small public library and a small university library.

Dr. Hendricks is interested in centralized processing and other co-operative ventures including library networks. He also retains an interest in rare books. He has served as a consultant in Canada and Louisiana, and his articles have appeared in Library Journal and Journal of Library History. Two of his monographs are listed among the references to this paper.

Paper submitted June 1973

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